

Optimizing The Silaning Platform For Foreign Language Extracurricular Programs At The Indonesian Naval Academy

Evi Martiningsih^{1*}, Moestin Adi Puji P.M², Tresna Kusumawati³, M. Wandiru⁴, Sri Nurhayati⁵

¹ Politeknik Angkatan Laut, Indonesia, email: evimarti1@akademitnial.ac.id

² Politeknik Angkatan Laut, Indonesia, email: pujininggar@gmail.com

³ Universitas Hang Tuah, Indonesia, email: tresna@hangtuah.ac.id

⁴ Politeknik Angkatan Laut, Indonesia, email: umbuwandiru01@gmail.com

⁵ Politeknik Angkatan Laut, Indonesia, email: akunsrinurhayati82@gmail.com

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ABSTRAK

Kemampuan bahasa asing merupakan kompetensi strategis bagi taruna Akademi Angkatan Laut karena operasi maritim modern menuntut komunikasi internasional, kerja sama pertahanan, dan penguasaan pengetahuan teknologi militer. Penelitian ini bertujuan mengoptimalkan dan mengevaluasi Silaning, Sistem Informasi Language Learning berbasis Moodle, sebagai pendukung pembelajaran bahasa asing ekstrakurikuler di AAL. Platform ini mengintegrasikan manajemen kelas, materi digital, tugas, kuis, laporan nilai, serta konten H5P berupa video interaktif, dialogue cards, dan virtual tour 360. Penelitian menggunakan desain pengembangan dan evaluasi melalui pengujian black-box, uji respons sistem, dan survei penerimaan pengguna berbasis Technology Acceptance Model. Data diperoleh dari 100 responden yang terdiri atas taruna, dosen, dan tutor bahasa asing. Analisis PLS-SEM menunjukkan seluruh indikator memenuhi validitas konvergen dan reliabilitas konstruk. Seluruh hipotesis TAM diterima, dengan Behavioral Intention to Use berpengaruh paling kuat terhadap Actual Use. Silaning dinilai layak, fleksibel, aman, interaktif, sesuai dengan karakter pendidikan militer, serta mampu mengatasi berbagai keterbatasan utama pembelajaran konvensional sebelumnya.

ABSTRACT

Foreign language proficiency is a competence for Naval Academy cadets because modern maritime operations require international communication, defense cooperation, and access to military technology knowledge. This study aims to optimize and evaluate Silaning, a Moodle-based Language Learning Information System, to support extracurricular foreign language learning at AAL. The platform integrates class management, digital materials, assignments, quizzes, grade reports, and H5P content, including interactive videos, dialogue cards, and 360-degree virtual tours. The study employed a development and evaluation design involving black-box testing, system response testing, and a user acceptance survey based on the Technology Acceptance Model. Data were collected from 100 respondents comprising cadets, lecturers, and foreign language tutors. PLS-SEM analysis showed that all indicators met convergent validity and construct reliability requirements. All TAM hypotheses were accepted, with Behavioral Intention to Use exerting the strongest effect on Actual Use. Silaning is feasible, flexible, secure, interactive, and compatible with military education characteristics.

INTRODUCTION

Foreign language mastery has become a core competence for military personnel in a global security environment. Naval officers use foreign languages not only for daily interaction but also for multinational operations, defense diplomacy, joint exercises, peace support operations, humanitarian assistance, and the exchange of maritime science and technology. As the main

officer education institution of the Indonesian Navy, the Indonesian Naval Academy, or Akademi Angkatan Laut, must prepare cadets with practical language competence through classroom learning and mandatory extracurricular programs.

The implementation of foreign language extracurricular programs at AAL still faces operational barriers. Cadets have dense schedules, frequent military duties, and high mobility. The program also faces limited learning facilities, limited external tutors, and slow adoption of digital learning tools. These conditions reduce learning continuity. Cadets who miss a session often lose access to explanations, practice materials, and feedback. Conventional instruction also makes learning materials scattered across files, printed handouts, or messaging applications. This pattern weakens engagement and makes learning progress difficult to track (Cong-Lem, 2018; Fadillah & Yuniko, 2023; Melkonyan & Matevosyan, 2020).

Digital learning platforms can address these constraints because they provide access to materials and learning activities beyond a fixed classroom schedule. E-learning supports flexible access, richer learning resources, structured collaboration, and self-paced study. Prior studies show that well-designed e-learning systems can improve learning effectiveness when they combine content quality, system quality, user support, and active interaction (Al-Fraihat et al., 2020; Budiarti, 2015). For a military education context, this flexibility is important because cadets must balance academic learning with training, duty rosters, and field activities.

Silaning, or Sistem Informasi Language Learning, was developed to respond to this need. It is a web-based platform built on Moodle. Moodle was selected because it supports course management, role management, quizzes, assignments, grade reporting, and modular customization. It also aligns with social constructivist learning principles and supports standardized digital learning packages (Pradnyana & Pradnyana, 2015; Rizal & Walidain, 2019). To strengthen interaction, Silaning integrates H5P, or HTML5 Package. H5P allows instructors to build interactive videos, educational games, dialogue cards, quizzes, and virtual tours that can make language practice more contextual and engaging (Abusalim et al., 2024; Diaz-Rodas, 2024; Jacob & Centofanti, 2024; Singleton & Charlton, 2020).

The success of Silaning cannot be assessed only from its technical features. A system can function well but still fail when users consider it difficult, irrelevant, or disconnected from their learning needs. Therefore, this study evaluates Silaning through the Technology Acceptance Model. TAM explains technology adoption through perceived usefulness, perceived ease of use, user attitude, behavioral intention, and actual use (Davis, 1989; Nugroho, 2016; Portz et al., 2019; Sayekti & Putarta, 2016). This model fits the research objective because it measures whether cadets, lecturers, and tutors accept Silaning as a learning system.

This article aims to optimize and evaluate the Silaning platform for foreign language extracurricular programs at the Indonesian Naval Academy. It focuses on three objectives: first, to describe the platform design, user requirements, and implementation process; second, to evaluate system functionality and response through black-box and performance testing; third, to analyze user acceptance using TAM and PLS-SEM. The study contributes practical recommendations for AAL and offers an empirical basis for digital innovation in military language education.

METHOD

Research Design and Setting

This study used a development and evaluation design. The development component optimized the Moodle-based Silaning platform for foreign language extracurricular learning. The

evaluation component assessed system functionality and user acceptance. The research took place at the Indonesian Naval Academy and focused on the use of Silaning for cadets, lecturers, and foreign language tutors.

The procedure followed eight stages: problem identification, data collection, needs analysis, design, implementation, testing, evaluation, and manuscript preparation. Problem identification used observation of existing language learning practices, preliminary survey results, and literature review. Data collection used observation and questionnaires. Needs analysis identified the functions needed by administrators, lecturers, tutors, and cadets. The design stage used user-role analysis, UML logic, and interface planning. The implementation stage configured Moodle as the main learning management system and integrated H5P content. The testing stage used black-box testing and response-time assessment. The final stages evaluated TAM results and prepared the article.

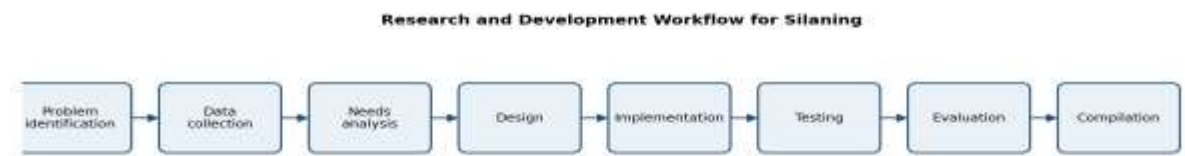


Figure 1. Research stages for optimizing and evaluating Silaning

Respondents and Instrument

The study involved 100 respondents. They consisted of cadets, lecturers, and foreign language tutors at AAL. The sample size exceeded four times the number of questionnaire indicators, because the instrument contained 20 indicators representing five TAM variables: perceived ease of use, perceived usefulness, attitude toward using, behavioral intention to use, and actual use.

The questionnaire used a five-point Likert scale. Respondents selected one of five responses: strongly disagree, disagree, undecided, agree, and strongly agree. The responses were converted into numerical scores from 1 to 5.

Table 1. Likert scale

Answer	Acronym	Score
Strongly disagree	STS	1
Disagree	TS	2
Undecided	R	3
Agree	S	4
Strongly agree	SS	5

System Development and Testing

The platform was developed on Moodle and adapted to the operational needs of foreign language extracurricular programs. The system included account administration, access rights, course management, teaching materials, quizzes, assignments, grade reports, announcements, and student activity records. H5P was added to support multimedia exercises and interactive learning objects.

System testing used black-box testing to verify whether each function produced the expected output. Response-time testing used JMeter to assess command execution time and to determine

whether the system met the initial non-functional requirements. These tests focused on practical system readiness before broader use by cadets and instructors.

TAM Hypotheses and PLS-SEM Analysis

The study tested six hypotheses based on TAM. H1 stated that perceived ease of use positively influences perceived usefulness. H2 stated that perceived ease of use positively influences attitude toward using. H3 stated that perceived usefulness positively influences attitude toward using. H4 stated that perceived usefulness positively influences behavioral intention to use. H5 stated that attitude toward using positively influences behavioral intention to use. H6 stated that behavioral intention to use positively influences actual use.

SmartPLS 4.0 was used to assess the measurement model and structural model. The measurement model assessed loading factors, average variance extracted, discriminant validity, Cronbach alpha, and composite reliability. The structural model assessed R-square values and path coefficients. The significance test used bootstrapping. A path was accepted when the t-statistic exceeded 1.96 and the p-value was below 0.05, following common PLS-SEM reporting standards (Chin, 1998; Ghazali, 2014; Hair et al., 2019).

RESULT AND DISCUSSION

Results

Initial Condition and User Requirements

The preliminary survey showed that 84.7 percent of students or cadets, tutors, and foreign language lecturers considered the extracurricular foreign language learning process at AAL suboptimal and inconsistent. This result confirmed the need for a platform that could centralize materials, support flexible access, and help instructors monitor learning activity.

The requirements analysis separated the system needs into functional and non-functional requirements. Functional requirements defined what the system must do. Non-functional requirements defined how the system must perform in terms of accessibility, availability, security, scalability, data protection, and data recovery.

Table 2. Functional and non-functional requirements

Functional requirements	Non-functional requirements
Admin can manage accounts.	The system can run on common browsers and mobile phones.
Admin can manage access rights.	The system can run 24 hours a day.
Admin can manage subjects and courses.	The system can be accessed from any location with internet access.
Admin, lecturers, and tutors can manage course information.	The system is protected from unwanted access.
Lecturers and tutors can manage teaching materials.	The system provides secure storage for uploaded data.
Lecturers and tutors can manage questions, assignments, and grades.	The system supports data recovery and backup.
Students can view learning materials.	The system supports many users.
Students can download teaching materials.	The system can be accessed by many users at the same time.

Students can view active assignments.	The system can handle different material formats.
Students can complete assignments.	The system can manage large data volumes.
Students can download assignments.	
Students can upload assignments.	
Students can view grades and news.	

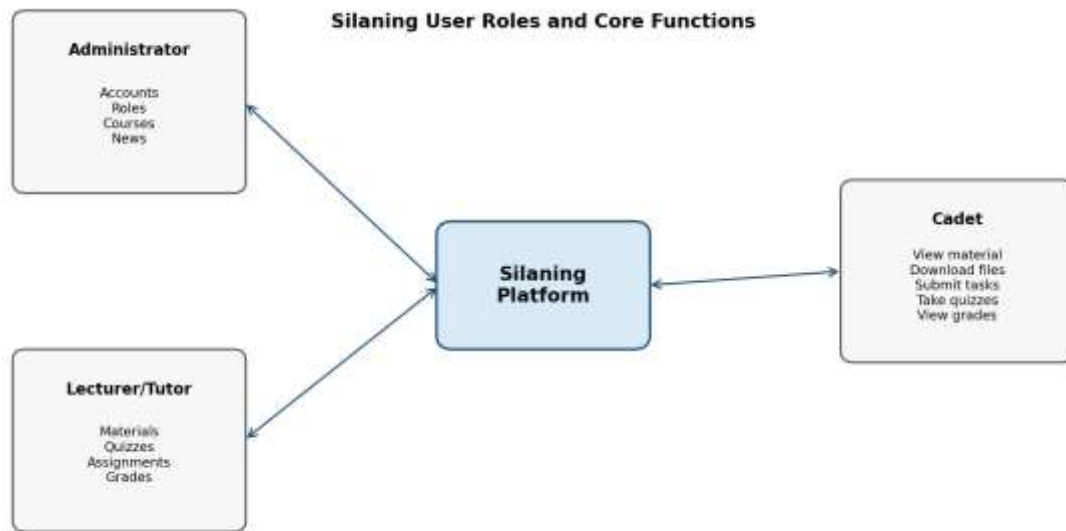


Figure 2. Silaning user roles and core platform functions

Silaning implementation

Silaning uses controlled account access. Users open the platform through a browser and enter the Silaning URL, <https://silaningaal.online/>, then log in with a username and password. The system does not provide self-registration. This design reduces unauthorized access and gives the administrator control over accounts for cadets, lecturers, and tutors.

The home page works as a centralized information space. It displays announcements, news, and the list of available menus. Cadets can enter foreign language courses, access materials, complete assignments, take quizzes, and view grades. Lecturers and tutors can upload content, manage activities, and monitor learning results.

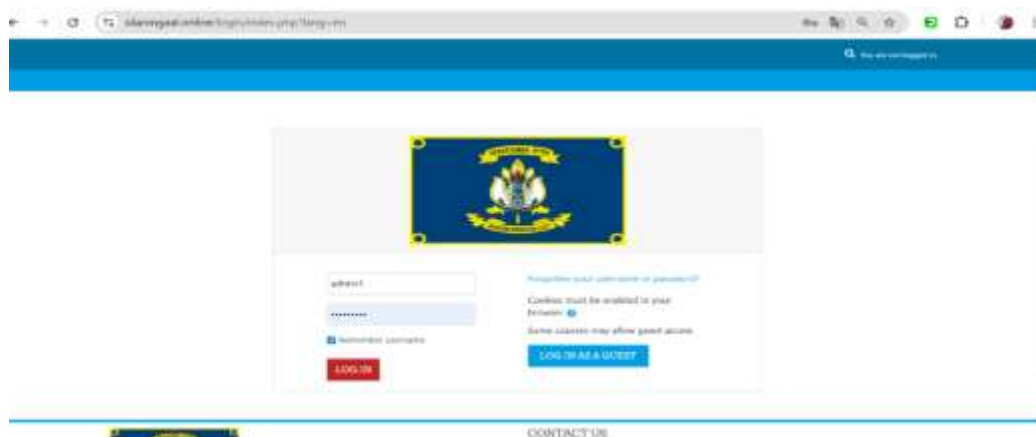


Figure 3. Silaning login page



Figure 4. Silaning home page

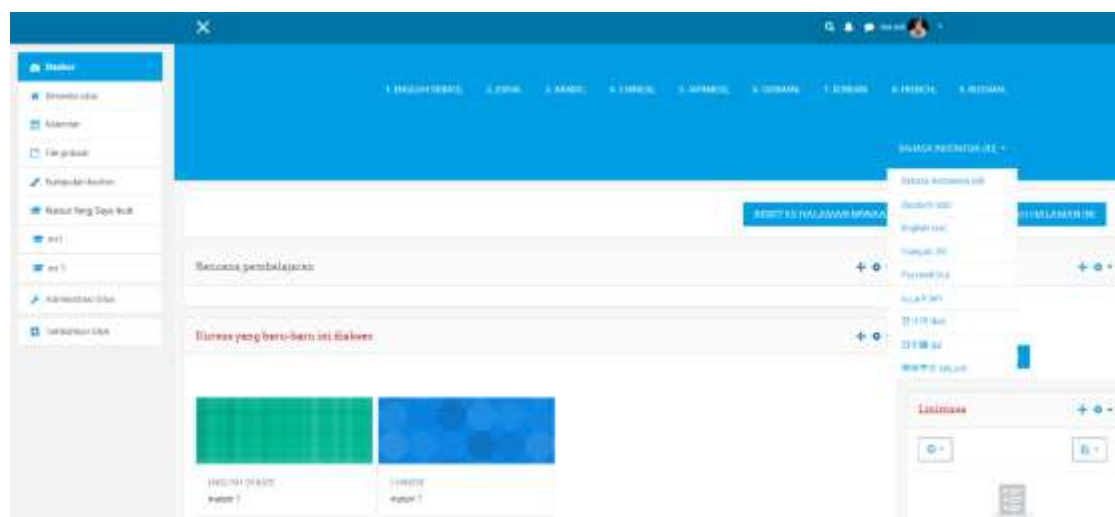


Figure 5. Foreign language course material page

H5P integration for military language learning

Silaning integrates H5P to make language learning more interactive and contextual. This integration changes the platform from a repository of digital files into an activity-based learning environment. It also supports the needs of military learners who require concise, task-oriented, and scenario-based language practice.

Interactive video supports simulated conversations and tactical communication scenarios. Cadets can watch a scenario and answer embedded questions during the video. This trains listening comprehension, response selection, and decision-making under time constraints. Dialogue cards help cadets memorize technical vocabulary, standard expressions, and operational phrases. This activity supports repeated practice and long-term retention. Virtual Tour 360 can introduce cadets to naval vessels, operational spaces, or allied headquarters before field exposure. It gives language tasks a concrete context and supports situational vocabulary practice.

The use of H5P also supports motivation and engagement. Prior research reports that H5P can improve academic achievement, self-efficacy, learning outcomes, and active engagement when instructors align the content with learning objectives (Abusalim et al., 2024; Jacob &

Centofanti, 2024; Singleton & Charlton, 2020). In the Silaning context, H5P addresses the weaknesses of conventional language instruction by giving cadets flexible practice that is more visual, interactive, and mission relevant.

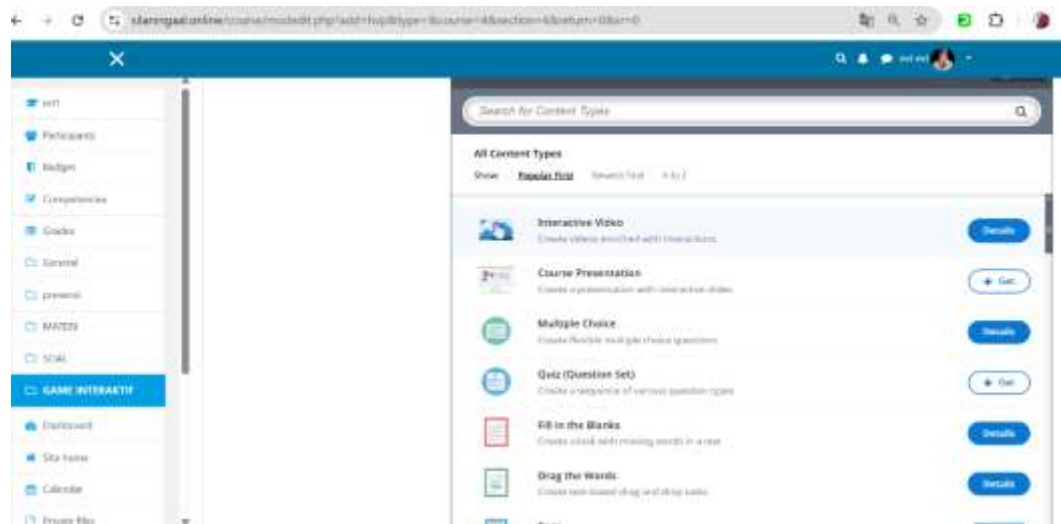


Figure 6. H5P content and educational game menu in Silaning

Functional testing and system response

Black-box testing showed that the tested Silaning functions operated according to the expected results. The login test confirmed that registered users could access the dashboard based on their login status. The negative login test confirmed that the system rejected incorrect credentials and displayed an invalid-login notification. This result indicates that the access-control mechanism worked as designed.

Response-time testing with JMeter showed that the system had acceptable response time and met the initial requirements. This result supports the non-functional requirement that the system must remain accessible and responsive for users who access it from different locations and devices.

Table 3. Black-box testing of the login page

No.	Testing example	Expected result	Observed result	Status
1	Login with registered username and password.	The dashboard appears based on the user login status.	The dashboard appeared based on the user login status.	Valid
2	Login with incorrect username or password.	The system stays on the login page, rejects access, and shows the message Invalid login, please try again.	The login page remained active and the system showed the invalid-login notification.	Valid

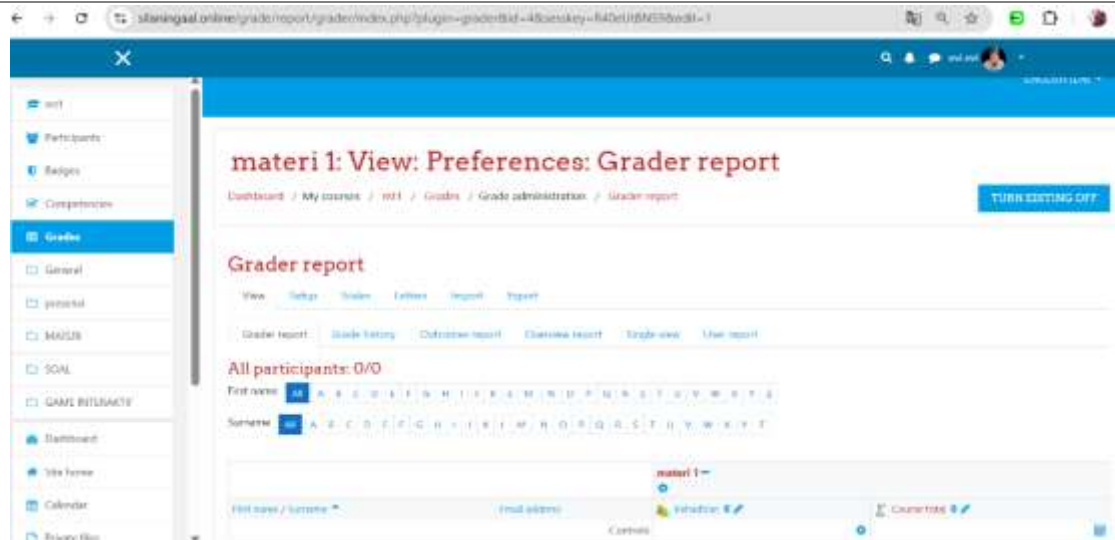


Figure 7. Grader report display for monitoring cadet activity

Measurement model evaluation

The PLS-SEM measurement model met the required validity and reliability criteria. All loading factors were above 0.70. Each construct also had an AVE value above 0.50, which shows adequate convergent validity. The constructs covered perceived ease of use, perceived usefulness, attitude toward using, behavioral intention to use, and actual use.

Table 4. Extracted loadings and average variance extracted

Latent variable	Indicator	Loading	AVE
Perceived Ease of Use	PEOU1	0.885	0.728
Perceived Ease of Use	PEOU2	0.789	0.728
Perceived Ease of Use	PEOU3	0.885	0.728
Perceived Ease of Use	PEOU4	0.850	0.728
Perceived Ease of Use	PEOU5	0.850	0.728
Perceived Ease of Use	PEOU6	0.857	0.728
Perceived Usefulness	PU1	0.724	0.761
Perceived Usefulness	PU2	0.923	0.761
Perceived Usefulness	PU3	0.924	0.761
Perceived Usefulness	PU4	0.899	0.761
Perceived Usefulness	PU5	0.913	0.761
Perceived Usefulness	PU6	0.834	0.761
Attitude Toward Using	ATU1	0.931	0.812
Attitude Toward Using	ATU2	0.933	0.812
Attitude Toward Using	ATU3	0.895	0.812
Attitude Toward Using	ATU4	0.843	0.812
Behavioral Intention to Use	BIU1	0.740	0.701
Behavioral Intention to Use	BIU2	0.934	0.701
Behavioral Intention to Use	BIU3	0.756	0.701
Behavioral Intention to Use	BIU4	0.902	0.701
Actual Use	AU1	0.811	0.737

Actual Use	AU2	0.899	0.737
Actual Use	AU3	0.793	0.737
Actual Use	AU4	0.923	0.737

Discriminant validity was also adequate. The Fornell-Larcker values showed that the square root of AVE for each construct was higher than its correlations with other constructs. This indicates that each latent variable measured a different concept within the TAM structure.

Table 5. Discriminant validity results

Variables	ATU	AU	BIU	PEOU	PU
ATU	0.901				
AU	0.856	0.858			
BIU	0.798	0.857	0.837		
PEOU	0.791	0.799	0.780	0.853	
PU	0.830	0.816	0.809	0.862	0.873

Reliability was confirmed through Cronbach alpha and composite reliability. All Cronbach alpha values were above 0.85, and all composite reliability values were above 0.90. These results show strong internal consistency for the measurement items.

Table 6. Cronbach alpha and composite reliability

Latent variable	Cronbach alpha	Composite reliability
PEOU	0.925	0.941
PU	0.936	0.950
ATU	0.923	0.945
BIU	0.855	0.903
AU	0.879	0.918

Structural model evaluation

The R-square values show that the model explained a strong proportion of variance in the dependent constructs. Perceived usefulness had an R-square of 0.743. Attitude toward using had an R-square of 0.711. Behavioral intention to use had an R-square of 0.706. Actual use had an R-square of 0.734. Perceived ease of use did not have an R-square value because it served as an independent variable in the model.

Table 7. R-square values

Construct	R-square	Adjusted R-square
PEOU	-	-
PU	0.743	0.740
ATU	0.711	0.705
BIU	0.706	0.700
AU	0.734	0.732

Bootstrapping results showed that all six hypotheses were accepted. The strongest relationship was the effect of behavioral intention to use on actual use, with an original sample value of 0.857 and a T-statistic of 41.231. This means that users who intended to use Silaning were

highly likely to use it in real learning activities. Perceived ease of use also had a strong effect on perceived usefulness, with an original sample value of 0.862 and a T-statistic of 34.504. This indicates that users considered Silaning useful when they found it easy to operate.

Table 8. Path coefficient results

Hypothesis	Relationship	Original sample	T-statistic	P-value	Decision
H1	PEOU to PU	0.862	34.504	0.000	Accepted
H2	PEOU to ATU	0.293	3.445	0.001	Accepted
H3	PU to ATU	0.578	7.631	0.000	Accepted
H4	PU to BIU	0.472	4.439	0.000	Accepted
H5	ATU to BIU	0.406	3.759	0.000	Accepted
H6	BIU to AU	0.857	41.231	0.000	Accepted

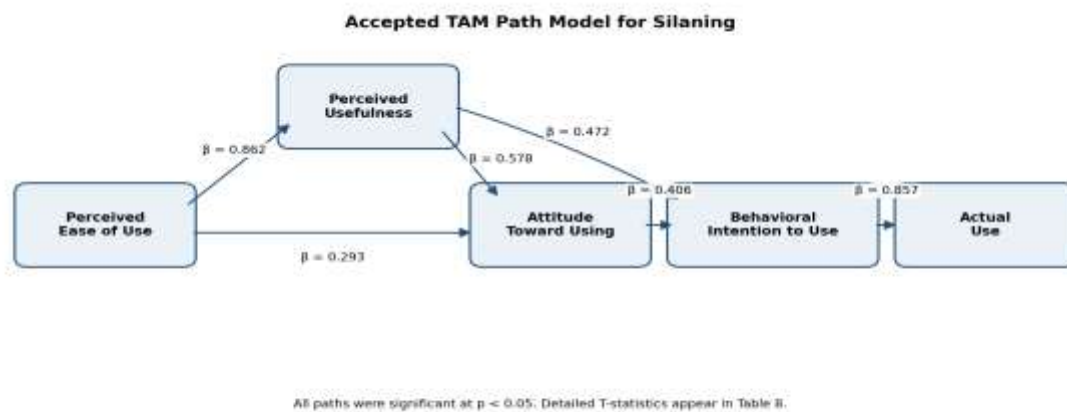


Figure 8. Accepted TAM path model for Silaning based on SmartPLS output

Discussion

The findings show that Silaning addresses the main weaknesses of the existing extracurricular language learning process. First, it centralizes materials and learning activities. Cadets can access course materials, assignments, quizzes, announcements, and grades through one platform. Second, it supports flexible learning. This is important in military education because cadets often have training, duty, and mobility requirements that disrupt fixed classroom attendance. Third, it gives lecturers and tutors better control over learning activity because the system records participation, assessment results, and completion data.

The accepted H1 result confirms that ease of use plays a central role in perceived usefulness. Users viewed the platform as more useful when the interface, access procedure, and learning menus were easy to operate. This relationship is relevant for military learners because a platform that requires complex navigation will compete with limited training time and may reduce adoption. The accepted H2 and H3 results show that ease of use and usefulness build positive user attitudes. In practice, cadets and instructors respond positively when the platform saves time, organizes content, and supports meaningful learning tasks.

The accepted H4 and H5 results show that usefulness and attitude form behavioral intention. Users are willing to continue using Silaning when they see its direct learning value and have a positive experience with the platform. The accepted H6 result is the most important empirical

finding. Behavioral intention had a dominant and significant effect on actual system use. This means Silaning was not only perceived as useful but also translated into real use behavior. The T-statistic of 41.231 gives strong statistical support for this conclusion.

The integration of H5P strengthens the pedagogical value of Silaning. Interactive videos can train listening and decision-making through mission-relevant scenarios. Dialogue cards can improve retention of technical vocabulary and operational phrases. Virtual tours can create contextual learning before cadets face real environments. These features align with the needs of foreign language learning in a naval academy because cadets need language competence that connects to operational tasks, not only general classroom exercises.

The optimization of Silaning also has organizational value. It reduces dependence on scattered materials and manual monitoring. It supports continuity when tutors, lecturers, or cadets cannot meet face to face. It also creates a data trail that can support academic supervision and future curriculum improvement. For these reasons, Silaning can become a strategic digital learning infrastructure for foreign language extracurricular programs at AAL.

CONCLUSION

This study shows that the optimized Silaning platform can support foreign language extracurricular learning at the Indonesian Naval Academy. The platform combines Moodle-based course management with H5P interactive content, controlled user access, digital materials, assignments, quizzes, grade reporting, and learning activity monitoring. This design fits the needs of cadets who require flexible and structured learning within a demanding military education schedule. Black-box testing confirmed that the tested functions worked as expected. Response-time testing also showed that the platform met the initial system requirements. User acceptance analysis through TAM and PLS-SEM showed strong empirical support. All measurement indicators met validity criteria. Reliability values were high. All structural hypotheses were accepted. Behavioral intention to use had the strongest effect on actual use, with a T-statistic of 41.231. These results indicate that Silaning is not only technically feasible but also accepted by users. It bridges the gap between rigid military operational demands and the need for high-quality, flexible, interactive, and sustainable foreign language education. Silaning can serve as a model for digital learning innovation in military education institutions.

RECOMMENDATIONS

First, AAL should develop a dedicated mobile application for Silaning. Cadets have high mobility, and a mobile application would make learning materials easier to access during field training or limited-connectivity conditions. Offline access to selected materials should be considered. Second, AAL should expand scenario-based learning content. Future modules should include joint international exercise communication, maritime patrol communication procedures, peacekeeping language tasks, humanitarian assistance coordination, and negotiation practice in multinational settings. Third, future studies should use longitudinal and comparative designs. Long-term studies can track cadet language proficiency across several semesters. Comparative studies can compare Silaning users and non-users, or test the platform in other military academies, to produce stronger evidence of effectiveness and transferability.

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